

The Marin Countywide Plan

Community Development Element Technical Report #1 Documentation of Land Use Database Files and Maps



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COMMUNITY DEVELOPMENT ELEMENT
TECHNICAL REPORT #1
MARIN COUNTY LAND USE DATABASES

I. SUMMARY

Understanding the effects of land development on Marin communities and complying with State of California standards for local general plans necessitates detailed land use information. Recognizing this, the Marin County Board of Supervisors directed the County Planning Department to prepare detailed records of land use and development activity by adopting the Economic Element of the Countywide Plan in 1985 and endorsing the update of the Marin Countywide Plan in 1986.

The Marin County Planning Department has created a series of parcel databases which serve a number of planning purposes and will form the basis of the Community Development and Transportation Elements of the Marin Countywide Plan. This technical report describes these databases and the computer programs developed for ongoing Marin County planning efforts.

The Marin County Planning Department tracks land use changes at a parcel level in the county through a series of computerized parcel database files. Each database stores information about existing and potential land use and development density. These databases were developed from 1986 to 1988 through several parcel surveys coordinated with planners in the eleven cities and towns of Marin and the Marin County Planning Department.

County planners analyzed each parcel database through two computer programs. The first program, LANDSUM.EXE, summarizes existing and potential land use by Countywide Plan planning area, census tract, traffic zone, city, and unincorporated community. The second program LUTMODEL.EXE models population and employment based on existing land use conditions and alternative growth scenarios, providing valuable information for transportation modeling and land use analysis.

An important tool in studying parcel information, the Marin County Planning Department's LANDTRAK Geographic Information System identifies parcels within specified areas. LANDTRAK allows County staff to study parcel-based information within districts such as traffic zones and unincorporated communities, greatly expanding knowledge of land use activity in areas which cannot be described through census tract information alone. LANDTRAK also generates reports and presentation graphics. Most of the maps in the updated Marin Countywide Plan will be produced using LANDTRAK.

II. AUTHORITY AND PURPOSE

The Marin County Planning Department established parcel-based data files, the LANDTRAK Geographic Information System, and a variety of computer programs for several purposes: implementing the 1985 Economic Element and updating the Countywide Plan, complying with State General Plan Laws, providing a land-based method of calculating population and employment information, and integrating the Countywide Plan Community Development and Transportation Elements.

1. Implementing the 1985 Economic Element and Updating the Countywide Plan.

The Marin County Board of Supervisors directed the County Planning Department to prepare several parcel inventories for the Economic Element of the Countywide Plan, adopted in June of 1985. Implementation of the Economic Element included the preparation of a semi-annual survey of proposed development projects and the creation of parcel databases documenting existing and potential development. The preparation of these databases was also endorsed by the Board of Supervisors' approval of the Countywide Plan Work Program, adopted in November of 1986. The Countywide Plan Work Program outlined the creation of several land use inventories: vacant land, redevelopable land, existing land use, proposed development, and existing commercial space.

2. Complying with State of California General Plan Standards.

The State of California general plan requirements can only be met with detailed information about demographic, land use, and transportation information. California Government Code Section 65302 (a) requires localities to describe and map standards of population density and building intensity in the land use element of their general plans. General plans must also identify certain areas including: flood plains, timber production zones, solid and hazardous waste storage facilities, open space, agricultural resources, mineral resources, parks, school, public buildings, and all residential, commercial, and industrial land. In order to meet these State requirements, the State Office of Planning and Research recommends that local governments produce a parcel by parcel catalogue of land uses (Office of Planning and Research "General Plan Guidelines", 1987).

3. Provide a parcel-based method of calculating land use, population and employment for the Countywide Plan Land Use and Transportation Elements.

The Marin County Planning Department's system of parcel data base files and computer programs offers previously unavailable opportunities to decision-makers. Planners can now project population and employment growth for any chosen geographic area and calculate build-out, the ultimate development of all parcels under current zoning and development policies. These scenarios then can be analyzed for their impact on the environment, public services and infrastructures (such as the transportation system). Parcel based figures describing employment and population conditions allow county planners to evaluate the projections provided by the Association of Bay Area Governments. ABAG projections can be cross checked with the development potential of vacant

land (and redevelopment potential of developed land) to identify whether projections correspond to the capacity of the land and the local market to absorb new activity.

Key to modeling the effects of land development on local streets, county parcel files provide the figures necessary to operate the Marin Transportation Model (MTM), using a transportation modeling software package called EMME/2. The MTM contains information about the existing transportation system and models how local roads "behave" under various land use conditions. The model relies on information summarized by traffic zone, a unit of analysis for which no published data sources exist. Accurate information at the parcel level which can be easily summarized by traffic zone is essential for the operation of the MTM. County parcel databases and computer programs provide the only source of information available for modeling the transportation effects of existing trends on local roads.

4. Integrate the Land Use and Transportation Elements of the Countywide Plan through the sharing of common databases, assumptions and projections.

The coordinated use of the County's system of parcel files, computer programs, the LANDTRAK System and the Marin Transportation Model makes it possible for the first time to demonstrate explicit linkages between land use activity and transportation impacts. The assumptions used by planners for projecting alternate land use scenarios can be shared and modeled by the transportation element. The process of sharing information about existing and projected land use will greatly improve the consistency between the Community Development and Transportation Elements of the Countywide Plan. The transportation model also will test different means of mitigating the effects of additional development on traffic conditions. This will enable decision makers to have a good understanding of the cumulative effects of their decisions on traffic conditions. Difficult strategic choices, from expanding the freeway to improving a local intersection, can be modeled and evaluated before important decisions are made.

III. LAND USE DATABASE DEVELOPMENT

The Marin County parcel inventory consists of two master databases. These database files show existing and potential land use for the 93,000 parcels in Marin County cities, towns, and unincorporated areas in an easily accessible computerized format. The land use, commercial square footage, and development potential information from these files offers the most complete and detailed picture of Marin County land use available to local planners and decision-makers. The method used to prepare these databases varied: planning staff focused on the careful identification of existing homes and commercial buildings and the development potential of vacant land. Staff prepared a more general study of less intensively developable rural, publicly owned, and private non-taxable parcels.

Planners studied the parcels stored in the VACANT and RURNTAX databases carefully using local plans, zoning ordinances, and personal review with planners in the eleven Marin cities and towns. Figure 1 indicates the names and components of the Marin County parcel files.

The Marin parcel files all contain similar information. Each parcel record has a parcel number and a series of codes representing existing and potential land use, existing and potential dwelling units and commercial square feet, and the location of the parcel within census tracts, traffic zones, community plan areas, cities, and planning areas. The land use coding system common to the database files is shown in Figure 2. Each database is described in the following section of this report.

Figure 1
Marin County Land Use Databases

Parcels in Each File by Database Title	Assessor's Use Codes (Use_Code)
1. Master Property File Index (MPFINDEX.DBF)	All Use Codes for Index Purposes 11-Single Family Homes 21-Multiple Family Homes
2. Detailed Land Use Files	
A. Vacant Land File (VACANT.DBF)	10-Vacant Single Family Parcels 20-Vacant Multiple Residential 40-Vacant Industrial Parcels 50-Vacant Commercial Parcels
B. Commercial Space Inventory (INVCOM.DBF)	41-Developed Industrial Parcels 51-Developed Commercial Parcels
C. Rural and Non-Taxable File (RURNTAX.DBF)	30-Rural-Over 10 Acres 31-Rural-Not Farms 32-Vacant Agricultural Preserves 33-Improved Agricultural 36-Rural Vacant Open Space 37-Rural Improved Open Space 60-Tax Exempt Parcels 80-Tax Exempt and Redevelopment 90-Unspecified

Figure 2
Standard Information in Marin County Parcel Files

Field Name	Definition
PARCEL	Assessors Parcel Number
EXISTLU	Existing Land Use Code Definition: 11 = Single Family Residential 21 = Multiple Family Residential 31 = Agricultural 32 = Open Space 41 = Industrial 51 = General Commercial Mixed commercial or commercial not described by office, retail and industrial categories. 52 = Commercial Office 53 = Commercial Retail 54 = Commercial Residential 55 = Commercial Recreational (e.g. Marinas) 81 = Quasi-Public Land Use (Private Non-Taxable) 82 = Public Land Uses (Public Non-Taxable) 91 = Vacant
EXUNITS	Existing Dwelling Units
EXISTSQFT	Existing Commercial Square Footage
EXFAR	Existing Floor Area Ratio
POTLU	Potential Land Use (See EXISTLU for land use codes)
POTSQFT	Potential Commercial Square Footage
POTUNITS	Potential Dwelling Units
POTFAR	Potential Floor Area Ratio

The Master Property File Index

The Master Property File Index (MPFINDEX. DBF) serves as the source and reference file for each of the smaller county land use databases. The MPFINDEX contains one record for each of the 93,000 County parcels. The Index alone lists the improved 64,096 single and 4,654 multiple family residential parcels in the county.

The Marin County Departments of Planning, Data Processing, and the Assessor's Office cooperated in the creation of the Master Property File Index. County staff transferred the Marin County Master Property File from the Data Processing Department's mainframe computer to a Planning Department microcomputer. County planners enhanced the Assessor's parcel file with information from the LANDTRAK geographic information system including the census tract, traffic zone, community plan area, countywide plan area, city, and an x/y coordinate location for each parcel. Planners may summarize information by any of these geographic aggregations and plot them on a LANDTRAK map. The file structure is shown in Appendix A.

Detailed Land Use Files

A. Inventory of Commercial Land

The commercial land file lists the existing square footage and land use type of all privately-owned commercial land in the County. The file records the land use and building size of approximately 3,000 parcels.

County planning and transportation staff prepared the commercial land database by copying all the commercial and industrial parcels from the Master Property File into a new database file called the Inventory of Commercial Land (INVCOM.DBF). The resulting database shows parcel size, building size, building age and land use information.

B. The Rural and Tax-Exempt Land File

The rural and tax-exempt land file (RURNTAX.DBF) contains 922 privately-owned rural, agricultural, and open space parcels as well as 3,639 private and publicly owned tax-exempt parcels in the county. As few of these parcels have any development potential, county planners did not conduct detailed land use surveys for this database. Information about development on publicly-owned land is limited to an assessment of government owned housing units which are critical in locating Marin County population centers. Some properties in this category, including the St. Vincent's-Silviera and Hamilton Field sites, may undergo extensive development. Planning staff identified the potential development of such sites using the Survey of Proposed Development (PROPDEV), and interviews with local planners.

Planners created the rural file by storing rural, agricultural, open space, and non-taxable parcels from the Master Property File in a separate database. Planners coded each parcel for existing and potential land use.

C. The Vacant Land File

The vacant land file (VACANT.DBF) includes roughly 12,000 parcels appropriate for single family homes and 1,400 parcels likely to develop as multi-family residential, commercial or industrial land uses. The vacant land file also contains estimates of future development.

Staff estimated the development potential of each parcel using assessor's parcel maps, general plans, and zoning ordinances. Staff also met with planners from each city and town to refine estimates of potential development based on specific circumstances.

Database Work Supplementing County Parcel Files

Marin County Planners performed additional research to complete their profile of County land use and employment activity. These additional databases supplement the parcel database files described above.

A. The Survey of Proposed Development

The Survey of Proposed Development (PROPDEV) is a semi-annual report on all development applications in Marin cities, towns and unincorporated communities. The report is based on a survey of projects larger than five residential dwelling units or 5,000 square feet of commercial space. Planners throughout the County contribute to the survey by completing a survey form on each development project in their jurisdiction. The PROPDEV report is used by builders, construction companies, real estate brokers, and new or expanding businesses. Planners and local government use PROPDEV to study current building activity around the county. County planners also use PROPDEV to update parcel databases with regard to recently completed or potential development. A partial PROPDEV summary table is shown in Figure 3. A sample PROPDEV record is provided in Figure 4.

B. The Underutilized Land Study

In order to calculate development potential from underutilized parcels, county planners studied the potential for improved commercial parcels to expand or redevelop. The study included a brief survey of local planners to identify underutilized sites and determine the likely increase in development on them. Information about increases in existing commercial density from underutilized sites is incorporated into the county's parcel files as potential development.

C. The Government Employment Database

Generating employment figures from land use information requires a record of public as well as private sector employment. County estimates of private employment originate from commercial building size information. The County's databases lack similar information about government buildings, however. In order to identify government employment levels, County staff calculated government employment through a phone survey of all public agencies in Marin. Staff will use these government employment figures in generating county employment totals. The structure of the government employment file is indicated in Appendix A.

Figure 3
Sample Summary Table
Survey of Proposed Development (PROPDEV)

Phase/Area	No.of Proj.	Site Acres	Single Family	Multi Family	Office	Retail	Industry
UNDER REVIEW:							
Belvedere	0	0.0	0	0	0	0	0
Corte Madera	1	84.6	160	0	0	0	0
Fairfax	0	0.0	0	0	0	0	0
Larkspur	3	28.4	141	0	64,000	0	0
Mill Valley	2	1.5	0	0	3,445	3,131	47,000
Novato	22	769.6	753	3,245	1,098,780	508,810	1,716,490
Ross	0	0.0	0	0	0	0	0
San Anselmo	1	0.4	0	10	0	0	0
San Rafael	32	553.3	285	1,068	396,120	114,085	134,657
Sausalito	1	12.5	0	0	0	0	0
Tiburon	6	503.4	178	28	0	0	0
Unincorporated	20	3,178.0	534	320	124,575	9,450	19,885
TOTAL	88	5,131.7	2,051	4,671	1,686,920	635,476	1,918,032
APPROVED:							
Belvedere	2	1.3	2	15	0	0	0
Corte Madera	0	0.0	0	0	0	0	0
Fairfax	0	0.0	0	0	0	0	0
Larkspur	3	46.5	70	248	345,000	0	0
Mill Valley	1	0.3	0	10	0	0	0
Novato	13	976.7	287	1,549	649,250	24,000	133,000
Ross	0	0.0	0	0	0	0	0
San Anselmo	2	39.0	17	0	0	0	0
San Rafael	12	153.1	54	516	19,079	4,500	12,400
Sausalito	4	4.3	11	0	4,500	0	12,800
Tiburon	3	57.5	44	0	0	0	0
Unincorporated	17	1,454.0	197	6	27,000	9,300	0
TOTAL	57	2,732.7	682	2,344	1,044,829	37,800	158,200

Fig 3 continued

Phase/Area	No.of Proj.	Site Acres	Single Family	Multi Family	Office	Retail	Industry
UNDER CONSTRUCTION:							
Belvedere	0	0.0	0	0	0	0	0
Corte Madera	1	55.0	0	148	17,000	0	38,400
Fairfax	0	0.0	0	0	0	0	0
Larkspur	1	0.0	0	0	0	10,000	0
Mill Valley	0	0.0	0	0	0	0	0
Novato	14	296.4	489	705	5,700	0	0
Ross	0	0.0	0	0	0	0	0
San Anselmo	1	1.2	0	20	0	0	0
San Rafael	13	278.9	152	347	26,340	3,000	90,156
Sausalito	1	1.8	0	0	14,400	0	0
Tiburon	4	49.8	54	0	0	0	0
Unincorporated	<u>10</u>	<u>276.2</u>	<u>205</u>	<u>54</u>	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL	45	959.3	900	1,274	63,440	13,000	128,556
CONSTRUCTION COMPLETE:							
Belvedere	0	0.0	0	0	0	0	0
Corte Madera	0	0.0	0	0	0	0	0
Fairfax	1	2.6	70	0	0	0	0
Larkspur	0	0.0	0	0	0	0	0
Mill Valley	3	31.4	0	174	0	0	0
Novato	6	12.3	8	80	20,680	10,000	8,550
Ross	0	0.0	0	0	0	0	0
San Anselmo	0	0.0	0	0	0	0	0
San Rafael	7	67.1	66	0	28,030	67,000	130,000
Sausalito	2	14.3	0	0	3,388	5,000	13,980
Tiburon	0	0.0	0	0	0	0	0
Unincorporated	<u>12</u>	<u>320.8</u>	<u>266</u>	<u>0</u>	<u>3,648</u>	<u>4,920</u>	<u>68,000</u>
TOTAL	31	448.5	410	254	55,746	86,920	220,530

Figure 4
Sample PROPDEV Record

PROPDEV5: PROPOSED DEVELOPMENT SURVEY FOR JULY, 1987

PROJECT: Spinnaker Point Unit 4

Record # 123

LOCATION

Parcel Numbers (list all): 009-081-10 to -46; 9-009-082-07 to 18
Street Address: East Canal Street
City or County Area: San Rafael
Census Tract: 1122

PROJECT SPONSOR

Name: Santa Barbara Savings
Address: 655 Redwood Hwy, MV 94941
Phone: 415-383-5522

PROJECT DESCRIPTION

Description: 41 townhouse & condominium units

Other Uses:

Type of Project:	RESIDENTIAL
Zoning Classification:	P-D
Site Area (Acres):	4.00
Proposed Open Space Acres:	0.00
Off-Street Parking Spaces:	0
Hotel/Motel Rooms:	0

TOTAL RESIDENTIAL UNITS

	Total	Built
Single Family Homes:	41	41
Multi-Family Homes:	0	0
Below Market Rate Units:	0	0

TOTAL COMMERCIAL SQUARE FEET

	Total	Built
Office:	0	0
Retail:	0	0
Industrial:	0	0

EXISTING USES: vacant

APPLICATION INFORMATION

Staff Planner:	B.T.
Application Number:	UP 86-21
Type of Application:	ED, UP
Date Approved:	06/24/86
Expiration Date:	06/24/87
Conditions on Development:	YES
PROPDEV4 Stage of Development:	UP and ED approved

CURRENT STAGE OF DEVELOPMENT:

Construction Complete

Next Approval Needed:

None

IV. COMPUTERIZED LAND USE MODELING

The Marin Countywide Plan examines land use and transportation conditions in a summary fashion by several geographic levels of aggregation: Countywide Plan planning area, community plan area, city, census tract, and traffic zone. County planners summarize and model information by these areas using two computer programs. The first program, (Landsum.EXE) sums existing and potential land use by geographic area. The second uses land use summaries from the first program to generate population and employment estimates.

The Planning Department computer program LANDSUM.EXE summarizes existing and potential land use information by specified geographic areas. LANDSUM reads a code assigned to each parcel representing the census tract, traffic zone, plan area, community, and city location of the parcel. County planners used the LANDTRAK system, explained later in this memo, to assign each parcel a code representing its location within different areas (called a geocode). Using the geocode, LANDSUM calculates the total number of existing and potential development for different land use categories from parcel data. The product of LANDSUM is a series of database files and tables showing existing and potential land use by census tract, traffic zone or other geocoded areas.

A second Planning Department computer program, LUTMODEL.EXE (for Land Use Tracking Model), provides estimates of population and employment by geographic area. The model uses vacancy rates to calculate occupied commercial space and households, which are multiplied against factors for employment per square foot and household size.

Employment from a census tract containing 300,000 square feet of commercial office space which is 90% occupied, for example, might be calculated in LUTMODEL as follows:

1. Assume that there is one employee for every 300 square feet of occupied office space. Also assume that 60% of the total number of employees work in service industries and 40% work in the finance, insurance, and real estate industries.
2. Multiply 300,000 commercial square feet by the 90% occupancy rate to yield 270,000 occupied commercial square feet.
3. Divide the 270,000 square feet of occupied space by 300 square feet per employee to yield 900 jobs in the census tract. Multiply the 900 jobs by 60% to produce 540 service industry jobs and by 40% to produce 360 finance, insurance, and real estate industry jobs.

LUTMODEL would calculate population from households in a census tract with 1,000 housing units and a sample 5% vacancy rate as follows:

1. Assume that the household population to the census tract is 2.4 persons per household.

2. Multiply the 1,000 homes in the census tract by 95% to calculate occupied housing units (950 occupied units).

3. Multiply 950 occupied units by 2.4 to yield 2,280 persons per tract.

These examples illustrate the importance of the assumptions used to generate employment and population from housing units and commercial space. LUTMODEL.EXE operates with any set of assumptions provided by County planners so that these critical factors can be modified and improved as often as necessary. The multipliers actually used to calculate population and household estimates from land use figures for the Countywide Plan will be documented in later technical reports for the Community Development and Transportation Elements.

V. THE LANDTRAK GEOGRAPHIC INFORMATION SYSTEM

The County Planning Department acquired the LANDTRAK computerized Geographic Information System to assist in producing Countywide Plan maps and detailed parcel reports. The Marin County LANDTRAK system produced maps and reports on specified areas. Figure 5 lists some of the geographic areas available in LANDTRAK for mapping and generating reports.

A. Streets in LANDTRAK

The LANDTRAK system uses a computerized street file produced by the U.S. Bureau of the Census: the DIME file. DIME stands for Dual Independent Map Encoding, a description of how the computer file locates each street in a geographic area. The DIME street file shows every intersection or bend in a street as a point (or street node) joining two lines (or street links). Each of these points or nodes is represented by an x and y coordinate on a grid. The grid encompasses every part of the County, such that every street intersection has a unique x/y coordinate locating it in relation to every other place in Marin.

Each link (street line) and node (point joining two line segments) is part of a street database file which also contains information about the name of the street, the address ranges along the street, and the location of the street within cities, zip code areas, and census tracts. Using the DIME file, LANDTRAK knows the location and name of every street in Marin. This street file is important because it provides a geographic reference for all other information stored in LANDTRAK.

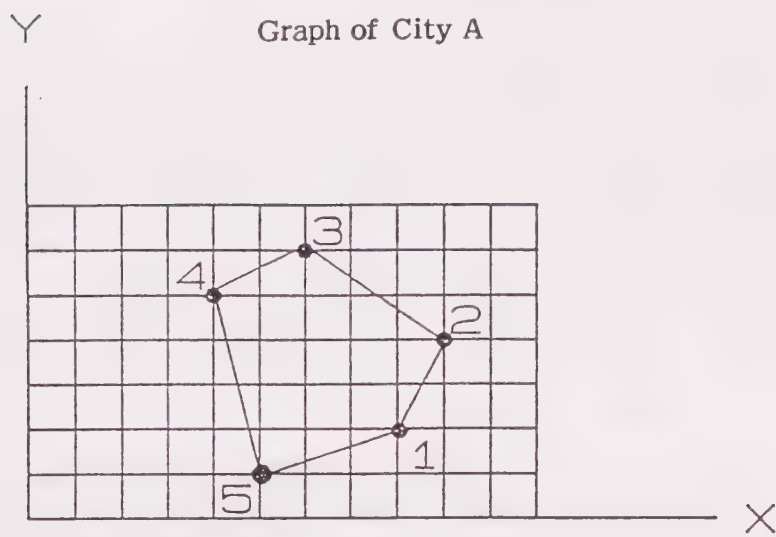
B. Maps in LANDTRAK

The LANDTRAK system stores information about the geography of Marin County as points and lines on a grid. As with the DIME file, each point in LANDTRAK has an x and a y coordinate. Each line joins two or more points. An area (or polygon) such as a city, for example, is remembered in LANDTRAK as a series of points, each assigned an x/y coordinate, and each joined by a line. See Figure 6 for an example of this.

Figure 5
Geographic Areas

#	File Name	Description
1.	400FOOT	Boundaries of Department of Public Works 400' Maps
2.	BAYPOLICY	Bayfront Conservation Zone Policy Areas
3.	BAYZONE	Bayfront Conservation Zone Rezonings
4.	CITYCORR	Boundary of the City-Centered Corridor
5.	CENSUS	Census Tracts
6.	CITIES	Cities
7.	COMMPLAN	Unincorporated Communities and Community Plan Areas
8.	COUNTY	Marin County Boundary
9.	DAMFAIL	Dam Failure Inundation Areas
10.	FAULTS	Faults in Marin County
11.	FAULTZNS	Alquist-Priolo Special Study Areas
12.	FIREDIST	Fire Protection District Boundaries
13.	FLDPLAIN	Flood Plain Boundaries
14.	FLOODZON	Flood Control Zones
15.	HIGHSCHL	High School District Boundaries
16.	MAJROADS	Major Marin County Roads
17.	MINROADS	Minor Marin County Roads
18.	PARKS	Parks and Open Space Areas in Marin County
19.	PLANAREA	Countywide Plan Planning Areas
20.	RANCHOS	Marin County Historic Rancho Boundaries
21.	RIDGE	Ridge and Upland Greenbelt Policy Areas
22.	ROADS1	Primary Roads
23.	ROADS2	Secondary Roads
24.	ROADS3	Minor Roads
25.	SCHOOLS	Elementary School District Boundaries
26.	SPHERES	City Spheres of Influence
27.	SPHORIZ	State Plane Coordinate Lines-Horizontal
28.	SPVERTIC	State Plane Coordinate Lines-Vertical
29.	STREAMS	Streams
30.	TAM2	Tamalpais Community Planning Area Neighborhoods
31.	TRAFZONE	Marin Transportation Model Traffic Zones
32.	URBSERV	Urban Service Areas
33.	USGSQUAD	USGS Quad Sheet Boundaries
34.	WMARIN	West Marin Roads and Streams

Figure 6
Special Districts in LANDTRAK



Point	X Coordinate	Y Coordinate
1	8	2
2	9	4
3	6	6
4	4	5
5	5	1

Each geographic area in LANDTRAK is a polygon. The Marin County boundary, city boundaries, and park boundaries are all stored in LANDTRAK as polygons. Polygons of the same district type, all parks for example, are stored in a single computer file called a feature file. Each feature file is created through a process called digitizing: putting paper maps into a computerized or digital format. Digitizing involves tracing a map over an electronic board that translates each line and curve in a map into lines and points which have x/y coordinates. The County Planning Department has already digitized many areas into the LANDTRAK system. The geographic areas available in LANDTRAK are shown in Figure 11.

C. Parcel Locations in LANDTRAK

Each parcel in the County has an assessor's parcel number and most have addresses. These parcels are stored in LANDTRAK by matching parcel addresses to Census Bureau DIME file addresses. Parcels from the Assessor's file are matched to street addresses in the DIME file through a special LANDTRAK routine called address matching where LANDTRAK searches for a parcel's street name, address, city, and zip code in the DIME file. When it finds a match, it assigns an x/y coordinate to all the parcels falling within the appropriate address range on a single street link. For example, LANDTRAK remembers that the 200 block of Main Street is between 6th and 7th streets in City A. The LANDTRAK Address Match routine finds all the parcels within this range of addresses and plots each parcel along the 2000 block of Main Street. The illustration below demonstrates how LANDTRAK located parcels along a street.

1. LANDTRAK uses a parcel database file from the assessor's office containing parcel number, address, city, and zip code, like the one below:

Parcel Number	Address	Zip
Parcel 123-123-11	2010 Main Street, City A,	94000
Parcel 123-123-12,	2011 Main Street, City A,	94000
Parcel 123-123-15,	2020 Main Street, City A,	94000

2. LANDTRAK also looks at the DIME Street File, which includes street names, address ranges, cities, zip codes, and the x/y coordinates of each street node. LANDTRAK then compares parcel addresses to the street file and finds the address range encompassing the parcel address. The parcel location is assigned by interpolating the numeric value of the parcel address within the street address range. For example, address 2010 Main would be located 10% of the distance along the block from the low end of the address range, 2000 Main. Odd and even addresses are plotted on the appropriate side of the street.

2010	2020
*	*

*	
2011	7th St. 2000-2100
6th St.	
Main Street, City A, 94000	

If there were four parcels in this range, LANDTRAK would distribute them as follows:

2010	2020
*	*

*	*
2011	2021

Using this method, all Marin parcels with addresses have been assigned an x/y coordinate location along a street. The location of each parcel may not reflect its true location along a street, since all parcels in any address range are placed at mathematically interpolated intervals. While this may not precisely represent parcel locations, it does permit fairly accurate study of parcels within communities and special districts.

D. Land Use Analysis and Mapping LANDTRAK

LANDTRAK compares the location of parcels, streets, and mapped districts to perform many types of analysis. LANDTRAK maps and produces reports on specified parcels and special districts such as cities, unincorporated communities, and environmental zones. LANDTRAK generated maps and reports will be used in every element of the Countywide Plan.

LANDTRAK maps of parcels, streets and features can be enhanced with logos, titles, labels, and printed on a black and white printer or a color plotter. The County uses a graphics software package, MIRAGE, to enhance LANDTRAK picture files and prepare them for printing. Map 1 is an example of a black and white LANDTRAK map produced using MIRAGE for the Tamalpais Planning Area. The County will produce a variety of maps using LANDTRAK for the Countywide Plan as well as for future Community Plans and special research projects.

LANDTRAK's parcel report capability will provide the County of Marin with valuable information for the Countywide Plan as well as community plans and special reports. The County Planning Department can now produce reports on land uses within sanitary districts, flood plains, or environmentally sensitive zones. LANDTRAK can also report on parcels within a given radius from any point, a function useful in preparing impact analysis or public hearing notices for projects affecting a single site. County planners identified all the parcels falling within traffic zones designed for the Countywide Plan Transportation Element using LANDTRAK. LANDTRAK has also been used to provide information for the Tamalpais and Dillon Beach Community Plans. Figure 13 shows a parcel report prepared in LANDTRAK of the Almonte neighborhood for the Tamalpais Community Plan.

Map 1
LANDTRAK Map of the Tamalpais Planning Area



Figure 7
LANDTRAK Parcel Report for Tamalpais Planning

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* * * * *
* * * Area Report Summary File For * * *
* * *   Tamalpais Comm Plan   * * *
* * * * *

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Report Category: Locations within/along Tam Areas
Report ID: 40 :

* The Total Number of LOCATIONSS is : 2257

Breakdown of TRACT

128100	:	0
128200	:	0
131000	:	0

Breakdown of Land Use

SingleFamily	:	1610
MultiFamily	:	67
General Comm	:	6
Office	:	3
Retail	:	8
Comm/Resid	:	2
Comm/Recreat	:	0
Industrial	:	0
Priv NonTax	:	5
Pub NonNax	:	63
Agriculture	:	0
Open Space	:	0
Vacant	:	435

Breakdown of Housing Unit

Less than 1	:	0.00
One Unit	:	1574.00
>1 and <2	:	0.00
>=2 and <5	:	135.00
>=5 and <10	:	93.00
>=10 and <50	:	132.00
50 or more	:	0.00

Breakdown of CommInd SqFt

<1000	:	0
1000-2999	:	15168
3000-4999	:	3872
5000-9999	:	27902
10000-49999	:	86842
50000-99999	:	96000
100,000+	:	0

APPENDIX A MARIN COUNTY PARCEL DATABASE FILES

1. The Master Property File Index

Field Name	Field Type	Field Length	Definition
Parcel	Character	8	Assessor's Parcel Number
Tax Area	Character	6	Assessor's Tax Rate Area Code
Use Code	Character	2	Assessor's Use Code
Juno	Numeric	2	Jurisdiction from Tax Area
NHood	Numeric	6	Assessor's Neighborhood Code
Acres	Numeric	8	Assessor's Parcel Acreage
Liv Units	Numeric	4	Assessor's Living Unit Record
S Number	Character	8	House Number
S Unit	Character	2	Unit Number
S Direct	Character	2	Street Direction
S Street	Character	26	Street Name
S Type	Character	4	Street Type
S Post	Character	2	Post Office Number
Commplan	Numeric	3	Community Plan Area
Planarea	Numeric	1	Countywide Plan Planning Area
Tract	Numeric	6	Census Tract
Trafzone	Numeric	3	Traffic Zone
X Coord	Numeric	7	X Coordinate (for LANDTRAK)
Y Coord	Numeric	6	Y Coordinate (For LANDTRAK)

2. The Land Use Summary File

Field Name	Field Type	Field Length	Definition
Parcel	Character	8	Assessor's Parcel Number
UseCode	Character	2	Assessor's Use Code
Name	Character	31	Owner's Name
Commplan	Numeric	3	Community Plan Area
Tract	Numeric	6	Census Tract
Trafzone	Numeric	3	Marin County Traffic Zone
Juno	Numeric	2	Jurisdiction from Tax Area
Planarea	Numeric	3	Countywide Plan Planning Area
Acres	Numeric	9	Parcel Size in Acres *
Existlu	Numeric	2	Existing Land Use Code
Exunits	Numeric	4	Existing Residential Units
Existsqft	Numeric	7	Existing Commercial Square Ft
Exfar	Numeric	4	Existing Floor Area Ratio
Potlu	Numeric	2	Potential Land Use
Potunits	Numeric	7	Potential Residential Units
Potsqft	Numeric	7	Potential Commercial Square Ft
Potfar	Numeric	4	Potential Floor Area Ratio
Build Use	Numeric	2	Building Use Code from INVCOM
Lot Sf	Numeric	12	Lot Square Footage from INVCOM
Database	Character	1	Source (VACANT, RURNTAX,INCVOM

3. The Inventory of Commercial Land

Field Name	Field Type	Field Length	Definition
Parcel	Character	8	Assessor's Parcel Number
Use_Code	Character	2	Assessor's Use Code
Commplan	Numeric	3	Community Plan Area
Tract	Numeric	6	Census Tract
Trafzone	Numeric	3	Marin County Traffic Zone
Juno	Numeric	2	Jurisdiction from Tax Area
Acres	Numeric	8	Assessor's Parcel Acreage*
S_Number	Character	8	Address Number
S_Unit	Character	2	Address Unit
S_Direct	Character	2	Street Direction
S_Street	Character	26	Street Name
S_Type	Character	10	Street Type
S_Zip	Character	10	Zip Code
S_Post	Character	2	Post Office
Lot Sf	Numeric	12	Lot Size in Square Feet
Yr_Built	Numeric	3	Year Building Constructed
Yr_Remod	Numeric	3	Year Building Remodeled
Exfar	Numeric	4	Existing Floor Area Ratio
Existlu	Numeric	2	Existing Land Use Code
Exunits	Numeric	4	Existing Residential Units
Existsqft	Numeric	7	Existing Commercial Square Ft
Potlu	Numeric	2	Potential Land Use
Potunits	Numeric	7	Potential Residential Units
Potsqft	Numeric	7	Potential Commercial Square Ft
Potfar	Numeric	4	Potential Floor Area Ratio

4. The Rural Land File

Field Name	Field Type	Field Length	Definition
Parcel	Character	8	Assessor's Parcel Number
Use Code	Character	2	Assessor's Use Code
Commplan	Numeric	3	Community Plan Area
Tract	Numeric	6	Census Tract
Planarea	Numeric	1	Countywide Plan Planning Area
Trafzone	Numeric	3	Marin County Traffic Zone
Juno	Numeric	2	Jurisdiction from Tax Area
Existlu	Numeric	2	Existing Land Use Code
Exunits	Numeric	4	Existing Residential Units
Existsqft	Numeric	7	Existing Commercial Square Ft
Exfar	Numeric	4	Existing Floor Area Ratio
Potlu	Numeric	2	Potential Land Use
Potunits	Numeric	7	Potential Residential Units
Potsqft	Numeric	7	Potential Commercial Square Ft
Potfar	Numeric	4	Potential Floor Area Ratio

5. The Vacant Parcel File

Field Name	Field Type	Field Length	Definition
Parcel	Character	8	Assessor's Parcel Number
UseCode	Character	2	Assessor's Use Code
Name	Character	31	Owner's Name
Commplan	Numeric	3	Community Plan Area
Tract	Numeric	6	Census Tract
Trafzone	Numeric	3	Marin County Traffic Zone
Juno	Numeric	2	Jurisdiction from Tax Area
Planarea	Numeric	3	Countywide Plan Planning Area
Address	Character	33	Parcel Address
Acres	Numeric	9	Parcel Size in Acres *
Existlu	Numeric	2	Existing Land Use Code
Exunits	Numeric	4	Existing Residential Units
Existsqft	Numeric	7	Existing Commercial Square Ft
Exfar	Numeric	4	Existing Floor Area Ratio
Potlu	Numeric	2	Potential Land Use
Potunits	Numeric	7	Potential Residential Units
Potsqft	Numeric	7	Potential Commercial Square Ft
Potfar	Numeric	4	Potential Floor Area Ratio

6. The Government Employment File

Field Name	Field Type	Field Length	Definition
Class	Character	15	Type of Employer (e.g. School)
Name	Character	20	Name of Employer
Address	Character	20	Address of Employer
City	Character	15	City or Unincorporated Community
Tract	Character	4	Census Tract
Zone	Character	3	Traffic Zone
Employees	Numeric	4	Existing Number of Employees
Projection	Numeric	4	Future Additions to Workforce
Empshift	Character	1	Employment Change Over Time

APPENDIX B: REFERENCES

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**APPENDIX C
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Maurice Wolahan, Housing Authority of the County of Marin

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